Name: Date:

## Polynomial Factoring solution (version 644)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 33 = 0$$

**Simplify your answer(s) as much as possible.**

**Solution**

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 132}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-32}}{2}$$

$$x = \frac{-10 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 4\sqrt{2}\, i}{2}$$

$$x = -5 \pm 2\sqrt{2}\, i$$

Notice that $i$ in NOT under the square-root radical symbol!!

2. **Express the product of $-5 - 9i$ and $8 - 3i$ in standard form $(a + bi)$.**

**Solution**

$$(-5 - 9i) \cdot (8 - 3i)$$

$$-40 + 15i - 72i + 27i^2$$

$$-40 + 15i - 72i - 27$$

$$-40 - 27 + 15i - 72i$$

$$-67 - 57i$$

## Polynomial Factoring solution (version 644)

3. **Write function $f(x) = x^3 - 6x^2 + 11x - 6$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

**Solution**

| | | | | |
|---|---|---|---|---|
| | 1 | -6 | 11 | -6 |
| 3 | | 3 | -9 | 6 |
| | 1 | -3 | 2 | 0 |

$$f(x) = (x-3)(x^2 - 3x + 2)$$

$$f(x) = (x-3)(x-1)(x-2)$$

4. **Polynomial $p$ is defined below in factored form.**

$$p(x) = -(x+8)^2 \cdot (x+3)^2 \cdot (x-1) \cdot (x-5)^2$$

**Sketch a graph of polynomial $y = p(x)$.**